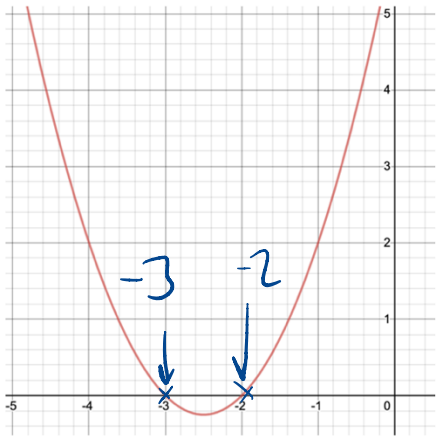
Algebra V (3) Difference of two squares

Do now:

What is the link?



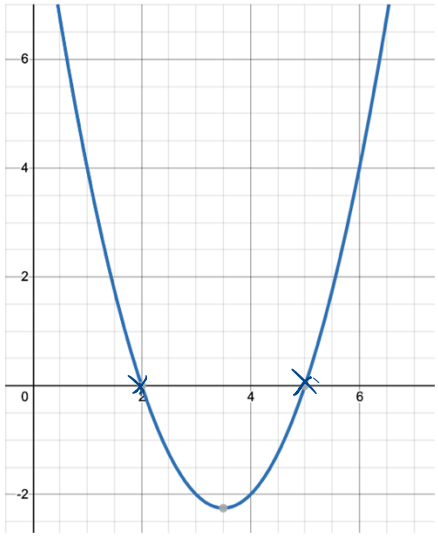
$y = x^2 + 5x + 6$

$0 = x^2 + 5x + 6$

$0 = (x+3)(x+2)$

$x+3 = 0$, $x = -3$

$x+2 = 0$, $x = -2$



$y = x^2 - 7x + 10$

$0 = (x-5)(x-2)$

Worked Example	Your Turn
$x^2 - 4$ $x^2 + 0x$ (SUM) -4 (PRODUCT) $= (x+2)(x-2)$	$x^2 - 25$ $= (x+5)(x-5)$
$2x^2 - 8$ $= 2(x^2 - 4)$ $= 2(x-2)(x+2)$	$2x^2 - 50$ $= 2(x^2 - 25)$ $2(x+5)(x-5)$

Factorise

a) $x^2 - 16$

b) $x^2 - 25$

c) $x^2 - 36$

d) $36 - x^2$ $= -(x^2 - 36)$ $= -(x+6)(x-6)$ $= (6-x)(x+6)$

e) $4 - x^2$

f) $100 - x^2$

g) $200 - 2x^2$

h) $300 - 3x^2$

i) $300 - 27x^2$

j) $300 - 12x^2$

k) $12x^2 - 300$

l) $12x^2 - 3y^2$

m) $3x^2 - 3y^2$

n) $9x^2 - 9y^2$

o) $9x^4 - 9y^2$

p) $9x^4 - 9y^6$

Factorise $4 - x^2$

$4 - x^2 = 2^2 - x^2$
$= (2 + x)(2 - x)$

or $(2-x)(2+x)$

Factorise

10 $9 - x^2$

11 $36 - x^2$

12 $100 - x^2$

13 $a^2 - b^2$

14 $9y^2 - z^2$

15 $16 - x^2$

16 $25 - x^2$

17 $81 - x^2$

18 $x^2 - y^2$

Factorise $2x^2 - 8x - 10$

$2x^2 - 8x - 10 = 2(x^2 - 4x - 5)$
$= 2(x - 5)(x + 1)$

Now check to see if the quadratic expression factorises.

Factorise

10 $3x^2 + 12x + 9$ $= 3(x^2 + 4x + 3)$ $3(x+3)(x+1)$

11 $5x^2 - 15x - 50$ $= 5(x^2 - 3x - 10)$ $= 5(x-5)(x+2)$

12 $4x^2 + 8x - 32$ $= 4(x^2 + 2x - 8)$ $= 4(x+4)(x-2)$

13 $3x^2 - 12$ $= 3(x^2 - 4)$ $3(x+2)(x-2)$

14 $2x^2 - 18x + 28$

$= 2(x^2 - 9x + 14)$
$= 2(x-2)(x-7)$

15 $4x^2 - 24x + 20$ $= 4(x^2 - 6x + 5)$ $= 4(x-5)(x-1)$

16 $3x^2 + 18x + 24$ $= 3(x^2 + 6x + 8)$ $= 3(x+4)(x+2)$

17 $5x^2 - 45$ $= 5(x^2 - 9)$ $= 5(x+3)(x-3)$

18 $3x^2 - 12x - 63$ $= 3(x^2 - 4x - 21)$ $= 3(x-7)(x+3)$

19 $18 - 3x - 3x^2$

$= -3(x^2 + x - 6)$
$= -3(x+3)(x-2)$

$= 3(2-x)(x+3)$

Find $1.7^2 + 0.3 \times 1.7$ = $1.7(1.7 + 0.3)$

$1.7^2 + 0.3 \times 1.7 = 1.7(1.7 + 0.3)$

$= 1.7 \times 2$

$= 3.4$

$1.7 \times 2 = 3.4$

Find, without using a calculator

$2.5^2 + 0.5 \times 2.5$

$= 2.5(2.5 + 0.5) = 2.5 \times 3 = 7.5$

1 $2.5^2 + 0.5 \times 2.5$

2 $1.3 \times 3.7 + 3.7^2$

3 $5.9^2 - 2.9 \times 5.9$

4 $8.76^2 - 4.76 \times 8.76$

5 $5.2^2 + 0.8 \times 5.2$

6 $2.6 \times 3.4 + 3.4^2$

7 $4.3^2 - 1.3 \times 4.3$

8 $16.27^2 - 5.27 \times 16.27$

2. $3.7(3.7 + 1.3) = 18.5$

3. $5.9(5.9 - 2.9) = 17.7$

4. $8.76(8.76 - 4.76) = 8.76 \times 4 = 35.04$

Find $100^2 - 98^2$

$100^2 - 98^2 = (100 + 98)(100 - 98)$

$= 198 \times 2$

$= 396$

Find, without using a calculator

$55^2 - 45^2$

$(55 + 45)(55 - 45)$

$100 \times 10 = 1000$

9 $55^2 - 45^2$

10 $20.6^2 - 9.4^2$

11 $7.82^2 - 2.82^2$

12 $2.667^2 - 1.333^2$

13 $10.2^2 - 9.8^2$

14 $13.5^2 - 6.5^2$

15 $8.79^2 - 1.21^2$

16 $0.763^2 - 0.237^2$